HCS Briefing to the Presidential Advisory Committee on High Performance Computing and Communications, Information Technology, and the Next Generation Internet

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HCS FY 1998 Budget by Agency and Program Activity

Total Dollars	**33.18**
DARPA	**9.40**
Scalable Systems and Software	5.00
Networking Systems	4.40
NSF	**0.90**
Computing Systems	0.90
NASA	**2.80**
Grand Challenge Support	2.80
NIH	**4.13**
NLM Biotechnology Informatics	1.14
NLM IAIMS grants	0.50
NLM HPCC Health Care Applications	2.35
NCI Frederick Biomedical Supercomputing Center	0.14
NSA	**7.20**
Secure Operating System Development	4.50
High Speed Data Protection Electronics	2.70
NIST	**3.40**
Information Technology Metrology, Testing and Applications	3.40
VA	**5.35**
Computerized Patient Record and Telemedicine	1.50
Clinical Workstations and Medical Imaging	0.85
Improve Telecommunications Infrastructure and Internet Connectivity	0.75
VA Hybrid Open Systems Technology (VA HOST)	1.75
VA/DoD Sharing	0.50

Budget Milestones

- Demonstrate the first node-level performance of ultra-low-power systems
- Complete composite protocol prototype implementation of an execution environment and a fast compiler for SmartPacket Methods
- Demonstrate the performance of novel backplane networks supporting security
- Develop architectures for high speed key management processors or servers
- Complete and release specification language for network engineering elements and management system

FY 1999/FY 2000 Budgets

- Main issue: Will HCS have a role in supporting the President's Commission On Critical Infrastructure Protection?

- We are likely to forward an initiative to include "assurance" in emerging Public Key Infrastructure (PKI) efforts.

Setting the HCS R&D Agenda

- Group review of current agency programs
- Hold workshops
  - High Confidence Systems Workshop August 6-7, 1997
- Look for “gaps” (group effort)
- Address gaps
  - Seek lead agency for work in identified gap (or)
  - Provide a multi-agency initiative
- Long term - near term balance
  - Technology transfer problem
  - Mostly long term, hard to move to short term

Private Sector Roles

- Private sector is not eager to participate
  - Commercial “best practice” is typically not good enough without imposed regulations or standards
  - Beta testing on the customer is not appropriate
  - Proof by emphatic assertion: “Buy me —I’m good”
- Independent judge typically needed
  - Quality standards
  - Evaluation labs (“underwriters laboratory”)
- Rare enlightened vendors do exist
  - Tektronix uses formal methods on oscilloscope designs

Agency Roles

- What agency does the work?
  - The one with the greatest need (flight safety to FAA or NASA)
- Funding mechanisms have little impact on decision
- Agency efforts can/should “set high-water mark” for best practice (state of the art) for private sector

Multiagency Work

- None yet attributable to HCS efforts
- But —NSA/DARPA Joint Technology Office
  - Exists
  - Works well
  - Excellent role model

Issue of Overlap

- Not a major issue
  - Too little work being done as it is
  - Islands of small effort in a sea of unmet needs

- However, group review of agency programs minimizes risk

Major HCS Concerns

- Lack of energy or effort in an area “lacking popularity”
- We are slow starting, trailing other PCAs